UNIVERSITY OF GONDAR
COLLEGE OF MEDICINE AND HEALTH SCIENCE
INSTITUTE OF PUBLIC HEALTH

MASTERS OF PUBLIC HEALTH IN HEALTH INFORMATICS
THESIS

ASSESSMENT OF INFORMATION SHARING USING SOCIAL NETWORK ANALYSIS AMONG HEALTH EXTENSION WORKERS IN KONSO WOREDA, SOUTHERN ETHIOPIA.

BY: GIRMA GILANO (BSC)
ADVISORS: 1.**DR. BERIHUN MEGABIAW (MD, MPH**)
2. **MR**. **ATINKUT ALAMIRREW** (**BSC, MPH**)

A THESIS SUBMITTED TO THE INSTITUTE OF PUBLIC HEALTH, COLLEGE OF MEDICINE AND HEALTH SCIENCES, UNIVERSITY OF GONDAR IN PARTIAL FULFILLMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN HEALTH INFORMATICS.

JUNE, 2012
GONDAR, ETHIOPIA

UNIVERSITY OF GONDAR

COLLEGE OF MEDICINE AND HEALTH SCIENCE

INSTITUTE OF PUBLIC HEALTH

ASSESSMENT OF INFORMATION SHARING USING SOCIAL NETWORK ANALYSIS AMONG HEALTH EXTENSION WORKERS IN KONSO WOREDA, SOUTHERN ETHIOPIA.

BY: GIRMA GILANO KASO

ADDRESS:

TEL: +251-913-930384

POSTAL ADDRESS: 155

E-mail: girmagilano@gmail.com

APPROVED BY THE EXAMINING BOARD

_____ _____

HEAD, INSTITUTE OF PUBLIC HEALTH

ADVISORS: DR. BERIHUN MEGABIYAW (MD, MPH) _____

MR. ATINKUT ALAMIRREW (BSC, MPH) _____

_____ _____

EXAMINER

JUNE, 2012

GONDAR, ETHIOPIA

ACKNOWLEDGEMENT

First of all I would like to acknowledge my Advisors Dr. Berihun Megabiaw, (MD, MPH) and Mr. Atinkut Alamirrew, (BSC, MPH) for their unreserved effort in all aspect of work of this thesis

I am also grateful for Gondar College of Medicine and Health Science (GCMHS), University of Gondar for providing this opportunity to conduct the research and allowing us to undertake our area of interest in that Specific place.

My gratitude also goes to Konso all health department staff and recording, for their co-operation in facilitating data collection and all arrangements.

My gratitude also goes to all my friends and colleagues who helped me during conducting this thesis

My thanks also go to Konso woreda health extension workers for participating voluntarily in this study.

ACRONYMS

EBM----------Evidence Based Medicine
GINFOSH----------Grading Information sharing

HEP ----------Health Extension Program

HEWs----------Health extension workers

INFOSH ---------- Information sharing

KM----------Knowledge Management

MR-QAP----------Multiple Regressions Quadratic Assignment Procedure

OLS----------Ordinary Least Square
PTSD- ----------Post Traumatic Stress Disorder

RSHAR----------Reason of Information sharing

SN ----------Social Network

SNA---------- Social Network Analysis

SNNPR----------South Nations Nationalities and Peoples' Region

WKW---------- Who Know Who

TABLE OF CONTENTS

LIST OF TABLE

*LI*ST OF FIGURE

LIST OF ANNEXES

ABSTRACT

INTRODUCTION-. Sharing information across organizational boundaries is central to efforts to improve government operations and services. Social network is systematic means of assessing formal and informal networks by mapping and analyzing relationships among people, groups, and units of work group or even entire organizations. In this article information sharing and problem solving methods of health extension worker in Konso woreda was assessed using social network analysis approach which could fill relational data gap.

OBJECTIVE- To assess information sharing among health extension workers in Konso woreda using social network analysis.

METHODS - A cross-sectional survey was conducted on all health extension workers in Konso woreda in South Ethiopia, using social network analysis which is an approach to assess knowledge, information exchange pattern and purpose based social connections. Trained data collectors used structured pretested roster type questionnaire and collected data. After preprocessing, data was entered EXCEL matrix spreadsheet then analysed by UCINET 6.365 software; multiple regression quadratic assignment procedures and other methods applied.

RESULTS - study participants were females with response rate of 93%, most of them were married. The network of Who know who network was significantly dense (density=79.28%, Z=9.12, p-value = 0.0002) while inadequate information sharing exist in health extension workers (density=27.2%, Z=-8.5462, p-value= 1.000). Correlation shows the two networks are associated significantly (p=0.000). Using MR-QAP indicated significant variables such as experience ($\mathfrak{B}$ =-.041, p=0.0085), media ($\mathfrak{B}$ =-0.0430, p=0.0055), site ($\mathfrak{B}$ =-0.11p= 0.0005) and who know who $\mathfrak{B}$ =0.1722, p=0.0005). People share information have positive performance ($\mathfrak{B}$ =0.0466, p=0.01450)

Conclusion - The information sharing in HEWs was inadequate. Sharing was observed among different sites rather than the same, people of different experiences than that of the same, and people who have different knowledge of Medias for information sharing but for who know each other and have performance.

1. INTRODUCTION

1.1. Statement of the problem

Sharing information across organizational boundaries is central to efforts to improve government operations and services. The central role of information and information sharing is becoming more and more evident over time, particularly as the world faces new and complex issues such as public health, where borders are generally irrelevant(1).

Health Extension Program (HEP) in Ethiopia is a community based health service delivery. The model prepared for the program assumed that, families changed their health practices, will change their neighbors(2). The program includes basic and essential preventive and curative services carried out by two female health extension workers (HEWs) trained and employed from the same community(3).

This study focused on how Social network analysis (SNA) helps health extension workers share their information. Social network analysis gives a rich and systematic means of assessing informal and formal networks of information sharing by mapping and analyzing relationships among people, groups, and units of work group or even entire organizations and factors impedes or facilitate sharing(4). In very simple way it is a set of social actors and their ties(5). It also provides understanding of how much information seeking important in groups(6). In consulting settings, these relationships are often ones communication, awareness, trust, and decision-making(7).

Investigators explained as, a process of finding hidden elements or properties through social network is SNA while knowledge management (KM) is the process of capturing, storing, sharing, and using knowledge(8).

Discovering patterns of social inter-relationship and interaction in a population is used for a ranging of applications as Social inter-relationship is usually modeled with networks(9). With this SNA technique the study identified relationships among individuals, and groups which are the base for information sharing and activity

performance (10). This might assist public health policy decisions, community enterprises and professional practices to look networked aspects of works(11).
And it is possible to investigate informal communication, to find key connectors across of the program team which is not studied in health extension workers as there is no literature mentioning SNA in Ethiopia(12). But other literatures identified some primary contexts where knowledge can be shared. Then, this study focused on relationship between the source and the recipient and recipient's learning predisposition(13).

The ability to assess relationships and resource flow at multiple levels allows for a holistic assessment. A network, in which all members are connected, prompts members to develop trust and a sense of obligation towards each other and encourages the generation of social capital. Despite the number of programs focused on building healthcare worker capacity and the understanding that increased collaboration and partnerships are important outcomes of capacity-building efforts (14).

In addition, rather than talking about information sharing in HEWS in Ethiopia it was better to think about the presence of social network. This was why social network analysis is very important to assess information sharing here.

1.2. Literature review

1.2.1. Information sharing and Density

Connections for information sharing exists usually in the relations between people of different levels and coworkers or same profession(15). Studies showed that member of the same profession share their information in desire to improve patient care(16). That means in any organisation. Such aspects of information sharing is also observed in portal of education where learning facilitated through SN (17). In work related of information sharing, it is important to understand the different interests of participants in the knowledge network. Moreover, sometimes there exist an interdependent relationship between the social and artifact network that help for information sharing (15).

Perceived self-efficacy plays an important role in influencing individuals' motivation and behavior to share information(18). In other study it is revealed that the article to be shared can be affected by media (19). But for sharing common item only the size of network and resources affects it.(20).

But the effective information sharing depend on involved sharing media (21). To increase communications and knowledge or information exchange it is nice to apply an external force like weekly meeting and Face-to-Face opportunities (22) that some investigator argue that analyses of form, location, types of agreements and managerial practices adopted are needed effective knowledge and information sharing (23).

Researches explain connection might not be often sufficient for sharing; rather it matters to whom one is connected. Against expectations regarding distance, average geographic distance is negatively associated with innovation performance i.e. international contacts don't matters(24). Broad thinking, being in SN has entertainment and experiences purposes(11, 25). Better than this, in emergency situations the usual way of communicating and information exchange may not enough to bring solution unless networked. (26). In any way, as knowledge of

health worker about something is shared the need for using this knowledge increases (27).

Beside this study conducted in Portugal showed network in large sample when comparing their contacts, subjects do not connect very much (density = 2.5%) (28). The same thing is happened in Kentucky (USA) where network density of infection prevention staffs in hospitals is 1.8%(29).
But in other study conducted in North Korean on PTSD individuals network density is 69% that shows good interconnections(30).

SNA strengthen boundary-spanning of knowledge exchange and increase informal inter-organisational relationships for better information sharing (10). Information sharing is not only for activity performance but also for self health; Socially isolated individual has major risk factor for illness because of lack of knowledge (31). This means SNA is not only the determinants but also a mechanisms for inducing information dissemination(32). So the usefulness of knowledge or information can only be realised when it is transferred(25).

Knowledge integration is the capacity to transform a public health organization's knowledge resources (11). Despite all the efforts that have put into knowledge management, our understanding of knowledge work, concrete approaches to improving knowledge workers' productivity were strangely enough and even measurement for knowledge worker's performance are still lacking (33).

Finally two ways identified. One constrains: there should be some constrains for which knowledge need to be shared and fragmented learning where individuals learn more but the organization as a whole does not triggering information sharing.(34).

1.2.2. Social Network Analysis

When different SNA groups involved in information sharing the connection within group is usually greater than that which is among groups (12). Therefore as we move to organizational effectiveness, we must pay more attention to the sets of relationships that people rely on to accomplish their work (6). That means SNA

should become an integral part of organisational design and strategy to support processes of inter-organisational community building, communication and information sharing (10). Finally the question is that how organizations might up the level of connections between site teams implementing novel programs is to be underlined for success. (12).

1.2.2.1. Centrality and centralization

In social network analysis centrality measures like degree, closeness and betweenness were frequently used. Through these investigators analyse the gathered data that explain how people and organizations connect to one another. For good connection: knowing what another person knows, timely access to that person; willingness of the person sought out to engage in problem solving; and a degree of safety in the relationship are frequently mentioned.(6). In study concerned about extra and intra team, explained that regardless of the direction of this influence, we expect that higher levels of connectivity will increase access to knowledge and give protective effect for knowledge management. (12).

High centrality explained as that, those individual are function at the center of their networks and facilitating linkage(35). other study explained differently as this leads to the assumption that individual with high centrality measure stayed in close contact with all persons. It considers indegree as source for prestige and out degree as source for knowledge (21).

In most studies degree used to assess the difference between the power structures, and hypothesis tested the about difference between the means using a t-test(36). In others it was discussed as analysis of this degree distribution describes the level of interaction between users and provides a robust indicator about the grade of heterogeneity in the network. It was also that explained the in and out degree of directed network are equal; degree of reciprocity and transitivity also used as high institutionalization (37). Some research conducted on groups used indegree and out degree to assess variance across the groups.(38).

In other words, indexes of the network explained as measure of degree of heterogeneity in the team. It measures the degree that there will be categories and dispersion of group members within the categories which great effect on the network like on density and centralization(39).

1.2.3. Statistical analyses in SNA

Analyses in research were based on Standard statistical inferences commonly. But in relational data these are likely to be wrong. Of course as linear regression for non-network analysis (OLS), QAP approach is become a workhorse in social network analysis especially for dyadic data. This enabled researches to use hypothesis testing and make statistical inferences with network data. Based on such opportunity different papers are flourished (40).

Since data on network variables typically is represented in the form of a square matrix, based on random permutations of the rows and columns of one variable, the QAP generates a permutation distribution that is similar to the underlying distribution for which inference is drawn. Dekker and Krackhardt discussed as it can shows the association between data on interpersonal relations(41).

Study done on evidence based medicine (EBM), found that homophily in physicians' attitude towards EBM was related significantly to collaborative behaviors undertaken within healthcare organizations and they found that individuals with similar characteristics were more likely to interact. In particular, those with similar medical specialties and organizational affiliations were more likely to collaborate(42).

Other study conducted in Addis Ababa revealed that as time of training getting long the relation among trainee increase but the significance test of degree centrality in homophily regions and the No. of isolates decreases throughout the time progress. It was also described, Capacity-building programs provides a unique opportunity to direct interactions.(14).

1.3. Justification of the proposed study

Sometimes you see organizations are looking for experienced and knowledgeable person to employ eventhough who is knowledgeable not clear. In practical area knowledge and experience are obtained through socialization of an individual to team of professionals.

Different studies show that information sharing and social network in community health workers is important for good activity performance, eventhough they are not covered the innovative health extension program of Ethiopia. The assumption of health extension workers in Ethiopia is based on the access to and quality of primary health care in rural communities can be improved through transfer of health knowledge and skills to households.

To achieve these objectives they have to equip with all the necessary knowledge which is usually impossible to have at the occasion of employment. This work related experiences and knowledge are mostly obtained through sharing acquired or created knowledge to one another as literatures reveals. And this needs some networked connection for sharing knowledge that is important to achieve these objectives

Therefore; the current study will identify social and information sharing networks that might clear what to do to achieve more with HEWs, helps co-coordinators and planners easy way of distributing information using key nodes, and will identify informal connections than expected which is important to rearrange the program activities.

.

2. OBJECTIVES

2.1. General objectives

To assess information sharing using social network analysis and related factors among health extension workers in Konso woreda

2.2. Specific objectives

1. To describe the magnitude of information sharing in health extension workers using network analysis in Konso woreda.
2. To compare information sharing and knowing each other network densities
3. To determine factors associated to information sharing among the health extension workers.
4. To empirically describe the structure of information flow among health extension workers

3. METHODS AND MATERIALS

3.1. STUDY PERIOD

This study was conducted from February to May 2012

3.2. Study design

A cross-sectional survey was conducted in Konso woreda, using SNA approach

3.3. Study area

Konso woreda is located in South Nations Nationalities and Peoples' Region (SNNPR) 569kms from the capital Addis and 372kms to south from the capital city of SNNPR. It has a population of 237,558 with total of 48,481 households , 43 kebeles and 83 HEWs, working in 43 health posts(43)

3.4. Study population and source population

The source population for this study is all the HEWs currently working in Konso woreda. A whole-network approach was chosen for this study because this approach uses all of the connections between people (HEWs) within a specified boundary (Konso woreda)

3.5. Inclusion criteria and Exclusion criteria

All HEWs who currently working (atleast a working during designing the study), in Konso woreda were included to participate in the study. While those who were accessed due to illness during time of data collection, stopped working as a health extension workers, or not present at the beginning of the Ethiopia year (less than 6 months from time of data collection) or those not present as workers during time of marking study population were excluded.

3.6. Sample size and sampling procedures

The sample size for the study is the total HEWs recently working in Konso woreda which is 83 health extension workers.

The sampling procedure; since study included the whole population no sampling procedure was implemented.

3.7. Variables of the study

The independent variables that were included in current study were related with dependent variables in many ways. One the independent (No of connection in who knows who) was seen to know whether information sharing density and knowing each other density were consistent. Then the prediction capacity of knowing each other and other variables over information sharing was observed.

3.7.1. Dependent variable

Information sharing

Here information shared means health extension workers were exchanged health extension work-related relevant information which is important to make decision, to perform daily activities and to carryout community service activities with another health extension workers in Konso woreda over the past 6 months. This definition provided on the questionnaire. Thus respondent read and the data collectors also explained so respondents understood it.

3.7.2. Independent variable

Work performance

Experience of the respondent

Media of sharing information

Shared vision on the profession

Shared vision is defined and measured as the extent to which a knowledge source and knowledge receiver (in the eyes of the receiver) shared goals, concerns, and purpose(44). This was the reason for sharing (RFSH)

Access to share information

Access to information sharing means the idea and belief of an individual respondent while grading his/her probability of obtaining knowledge from others and giving to them from what she/he knows easily. It was expected that, response indicate easy ways to obtain knowledge from workers of the field termed as good access. Eigenvector was investigated to understand it was the way HEWs grade level of their information share (GINFOSH).

3.8. Operational and terms definitions

Information sharing through Social network operationalised using different concepts:

Power (or Centrality) - If an actor gets responses from many others, who in turn get many responses, the actor is at the center of teams(36). In other way degree of centrality is the proportion of actors that send or receive responses to or from that actor.(45)

Density – Density captures how closely a group or subgroup is knit. It is a proportion that indicates the number of actual ties present in the group relative to the number of possible ties in the group.(8)

Betweenness centrality - indicates the extent to which a node lies on the shortest path between every other pair of nodes(8).

Cohesion - is an average number of ties it takes for a person in the group to "reach" another person in the group.(5)

In-degree centrality - The number of times HEW asked for information sharing

. **Alter** - An individual with whom another individual shares information.

Information sharing

Seeking work related relevant information from others - that is related to seeking relevant information from them.

Giving work related relevant information to others – that is related to providing relevant information to them.

Good information sharing – in this study is high number of connection of actors in the network in term of density and degree. Density of a cohesive network (e.g. one component with a density of >50%) is the richest. (29)

.**Social network** - is a set of social actors and the ties among them

Sociogram – a visual diagram of a social network in which actors are represented as nodes or vertices between lines which depict connections or "ties" between actors.

Information sharing media: the ways that serve to connect people, information and organisations through networks. Media is the ways through which people

communicate in the network(8) **Reach key player** - HEW capable of sharing information with the largest proportion of other nodes in the network.

3.9. Data collection and procedures (instrument, personnel, data quality control)

Standardized data collection tool was employed with primary data collection on work-related social networks. A well structured self administered questionnaire was prepared to explore the impact of social networks on individual uptake and use of knowledge by considering social and information sharing links.

Questionnaires: A lists of all staff working as HEWs obtained from woreda department of health. Using these lists, which were current lists existing at beginning of year, respondents were asked to check off the names of all staff members with whom they have worked or know depending on the criterion set for terms. We were also provided space for respondents to include someone who was not their staffs but a member of their network. Such tool is often called roster and/or recognition questionnaires.(32). The questions were derived from an empirical study of the role of trust in organizational setting social networks and investigating the Potential of Using Social Network , Analysis in Evaluation and the impact of social networks on knowledge transfer in long term care facilities: protocol for a study after modification to the study setting (32, 44, 46)

The questionnaire was translated to Amharic and retranslated back to English and pretested prior to surveys among HEWs in Arba Minch zuria woreda. All social network questionnaires were administered using pencil or pen. Data was collected with trained Diploma nurses who were not employed during the time. They were recruited depending on the condition of respondents; female applicants were given more chance since respondents were females.

3.10. Data processing and analysis

The data was checked for it completeness at field by the investigator and supervisor. Data was entered into a matrix in an EXCEL spreadsheet (47) and was analysed using UCINET 6.365 [Copyright (c) 1992-2011 Analytic

Technologies software] that is designed to calculate a variety of social network characteristics. We analysed different indicators, such as: number of connections (to assess information sharing density), individuals with highest number of nominations (to identify the true experts), ratio of internal to external
links, the proportion of total contacts that are inward (to analyse how sought after the knowledge of the group is), and the proportion of total contacts that are outward (which units seek help the most).(28). For all these we collected data from HEWs and obtained performance of each respondent from office.

. A square matrix was constructed representing correlation linkages among surveyed HEWs. Each row and column labelled code for each workers and intersecting cells represented the presence or absence of co-relationship. The analysis was begun systematically with two networks: who knows who (**WKW**) and information sharing (**INFOSH**) networks followed by converting all valued attributes data to network matrix and then different tests performed. The aim of focusing initially on these two networks is since knowledge measured through density and knowledge density more expected if HEWs know each; it is to know how much it contributes to information sharing and to know SN of HEWs. All health extension workers in the Konso woreda were included so whole network principles are considered during analyses. That means the network formed by each independent variable was used to see the relation and the prediction ability they may have information sharing.

The analysis passed three parts. The 1st part was a descriptive statistics which described centrality, centralizations and density measures. The 2nd part was tested hypothesis of densities of the networks (density of who knows who connection network and information sharing network) with comparative parameters. The 3rd part of analysis was done using QAP correlation and multiple regression quadratic assignment procedures to predict information sharing. And then all other independent variables that may be contributed for information sharing were fitted to model and their predictability observed. Before fitting all attribute, data were converted to matrix by absolute difference method and then

these valued or variables were dichotomized that means transformed to binary matrixes.

Multiple regression quadratic assignment procedures (MR-QAP) were performed to define predictor ties in health extension workers. MR-QAP is a combinatorial data-analysis procedure adopted routinely in social-network researches. The purpose of the MR-QAP is to regress a dependent relational matrix on one or more independent matrices, and to determine whether independent variables are significant predictors of the dependent variables. This procedure is used to model a social relation matrix using values of other relational matrices and control variables such as attributes of social actors(41)

ETHICAL CONSIDERATIONS

Primarily, ethical clearance was obtained from Institutional Review Board of University of Gondar, Institute of Public Health. Formal letter of cooperation was written for District Health Office. The permission letter was from woreda health department. The data collectors were clearly explained the aims of the study. Information then collected after obtaining good response from each respondent to participant in the study. Respondents were also informed that they can refuse or discontinue participation at any time they want and the chance to ask anything about the study is kept free for them.

The completion was voluntary and respondents were assured that no one could access to their answers. It was not possible to administer these questionnaires anonymously (without identification), because we need to use the names of respondents, all names were coded as soon as data collection completed, and original questionnaires stored very carefully. The purpose of the study was well written and explained by data collectors to respondents.

5. RESULTS

5.1. Socio- Demographic Characteristics

There are a total 83 health extension workers who were included in the study and 77(93%) were responded to the survey. HEWs who were stopped working and some who started education were unreached. The age range of the respondent was from 20-29years. Most of the respondents were Konso in their ethnicity, educational status 10+1, protestant in their religion, 3-4 years of work experience, mostly speak Konsegna as first language and their media of getting together was trainings.(see table 1)

Table1. General Characteristics of HEWs response in Konso woreda in2012

Variables	N (%)
Demographic information	
1.Age in year category	
< 20	5(6.5)
21-30	68(88.3)
31-40	4(5.2)
2. Marital status	
Single	33(42.9)
Married	39(50.6)
Separated	2(2.6)
Divorced	2(2.6)
Widowed	1(1.3)
3.Religion	
Protestant	45(58.4)
Orthodox	32(41.6)
4.Educational status	4 (5.2)
Diploma	73(94.80)
10+1	
5. work experience in years	
<1	7(9.1)
1-2	15(19.1)
3-4	32(41.6)
>4	23(29.9)
5.Ethnicity	
Konso	63(83.1)

Gewada	3(3.9)
Others	10(13)
6. First language	
Konsegna	51(66.2)
Amharic	14(18.2)
Oromegna	12(15.6)
7. Reason or vision sharing	
1.Since we are all in health extension profession	52(67.5)
2.The goal of the program can not achieved alone	40(51.9)
3.We are serving the same community	60(77.9)
4.I believe that it is difficult to solve daily problems alone	22(28.5)
8. Media for sharing	
1. mobile phone	55(71.5)
2. meting/evaluation	53(68.8)
3. training	64(83.1)
9. How do you grade your access to information sharing	
1. Narrow	41(53.2)
2. medium	35(45.5)
3. very high	1(1.3)

5.2. Social Network Analysis

5.2.1. Knowing each other network

Table2. Degree centrality measures of who know who network of HEWs in Konso woreda 2012

Centrality measure	Mean (range)	Centralization index, %
1. In-degree	64.8(36- 75)	12.5
2. Out-degree	64.8 (0-82)	21.2
3.Betweenness	11.1 (0-19.8)	0.13
4. Eigenvector	0.11 (0.052-0.116)	1.1
Density	79.28%	
No. of achieved connections	5382	
No. of obs.	83	

The variability is very high in out degree (0-82) that is another indication of little influence. It starts with zero because from 83 participants, one person can influence a maximum of 82 individuals (not self).

Network Centralization (Outdegree) = 21.178% and Network Centralization (Indegree) = 12.537% these indicates that on average there is slight difference on base of in and out degree centralization which are both very small (non centralized).

Eigenvector is closeness centrality measure described based on the sum of the geodesic distances from each actor to all others (farness).it measure popularity depending on the No. of actors connected to that actor. Here from 100% distance needed to be covered by an actor to be very popular 1.06% indicating actors were more peripheral. Betweenness 11.1% indicates that around 89% on the ties in the network do not need mediators to be connected. 0-19 range depicts a lot of variation(48). These statistics shows the network is not centralized.

And the overall density of connection in this network is 79.28% with 5382 No. of ties. That means among all possible ties 79.28% was achieved. This increased the confidence that there will be good information sharing among HEWs

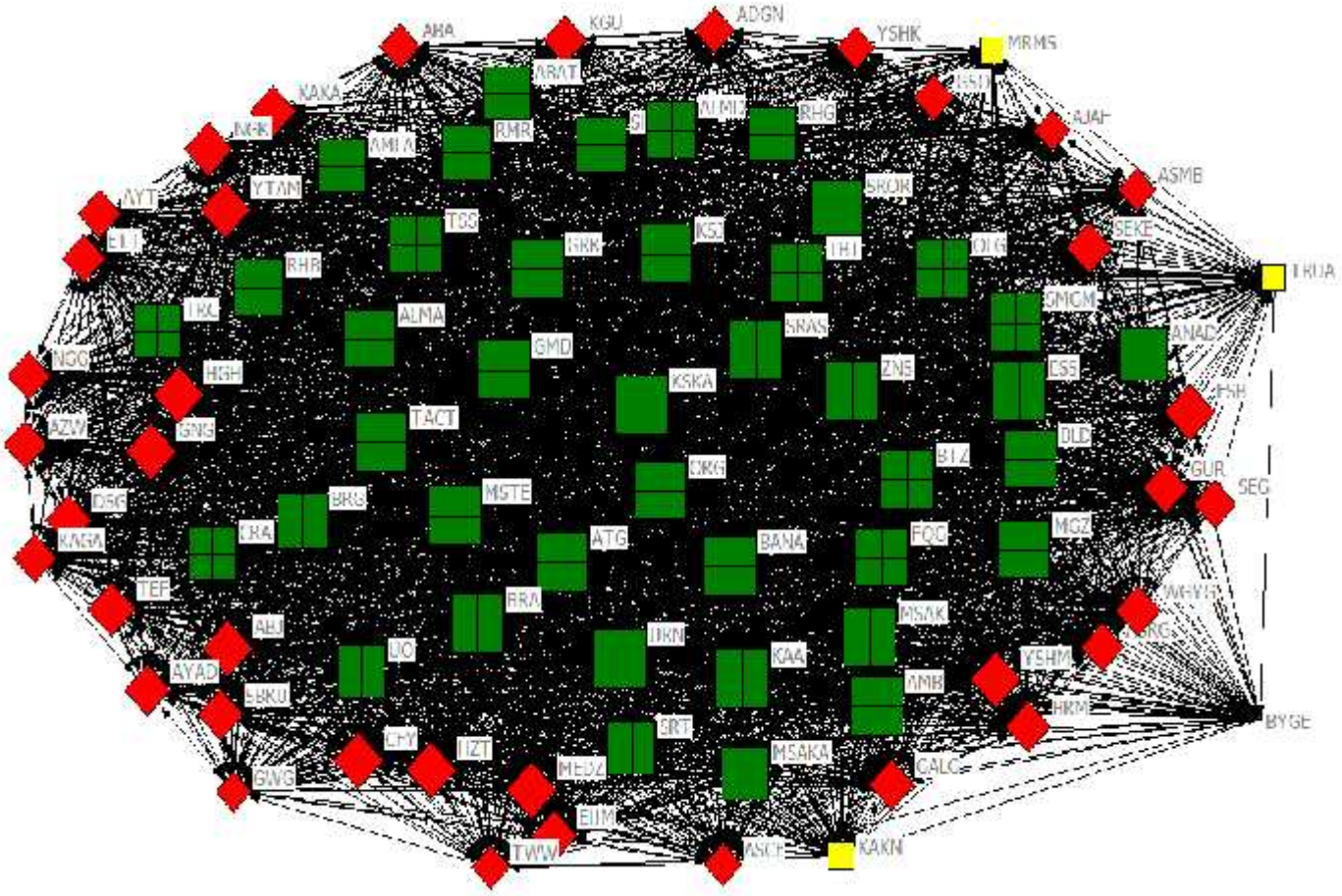

Fig1. A network graph[1] showing the connection among health extension workers in Konso woreda in 2012

. Each code (node) represents one health extension workers in the dataset and each link (edge) represents an existing connection tie among node pairs. The number of arcs (links) beginning at a node is called the *out degree* of the node. And they suggest connections, and in our case initiation of engagement or discourse. The number of arcs/links ending at a node is called the *in degree* of

[1] The size is according to degree centrality (80s-box and green color, 70s-diamond and red color , 50-60-square and yellow color)

the node, indicating the reception of engagement. Nodes are sized based on degree or importance and colors followed similarly

Close observation of the graph eventhough it was centralized some key players (AMB, KAA, GRK, MSAK, TACT, GMD, **SRAS, BANA, ALMA, and BRA**).

Except the last three codes the remaining were team leaders in their respective sites (place of work). By key player analysis Fragmentation was 0.228 which is greater than α =0.10 and interpreted as meaningful key players.

5.2.2. Information sharing network

Table3. Degree centrality measures of information sharing network of HEWs in Konso woreda 2012

Centrality measure	Mean (range)	Centralization index, %
1. In-degree	22.3 (14-37)	18.2
2. Out-degree	22.3(0-82)	73.8
3.Betweenness	54.6(0-344.4)	4.42
4. Eigenvector	0 .11 (0.052-0.197)	15
Density	27.19%	
No. of achieved connections	1850	
No. of obs.	83	

The table above shows Konso HEWs information sharing interaction. Actors in the network were much dispersed, in term of outdegree range (0-82) and as the result presented in **table 2,** their sociability and popularity were also equal 22.3. Similarly there is slightly low dispersion in being influenced by the other indegree range, although this intake is very low (14-37).

The betweenness is high 54.6but the resulting centralization from it was only 4.42%. This indicates that greater than half of the connections were made by mediation of others. There were small HEWs who nearby to each to share

informationand acting as the mediator. Eigenvector of the net work was 15% which means distance covered toward the center.

The centralization of these results were (Outdegree= 73.8%) and (Indegree = 18.2%) careful observation of outdegree indicates high variability across it and the coefficient of variability was 89%. From this we understand the network has a tendency of centralization. But, power of individuals in the network was still substantially vary across the network.

Overall density of information sharing network only 1/3 or 27.19% with 1850 No. of ties out of all possible 6806 observations were achieved that might have an interpretation of poor information sharing connection in HEWs

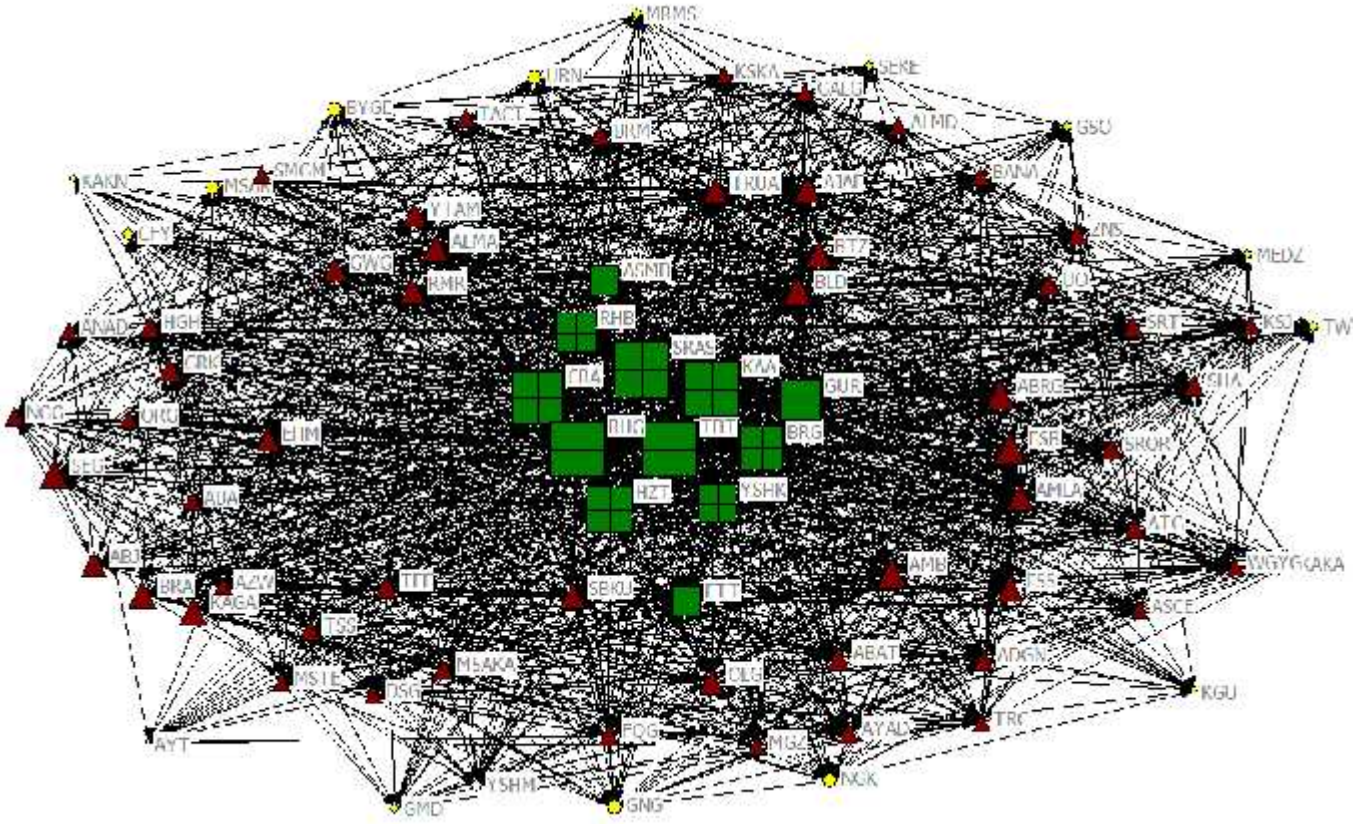

Fig2. **Network graph[2] depicting the Information sharing connection in health extension workers in Konso woreda in 2012**

[2] 50-80 = box and green, 30-40= up triangle and brown, 10-20=circle and yellow

All the interpretations are the same as those expressed in fig1. In other words the numbers of arcs beginning at the node in this figure were the people came to the node to ask help when facing work related problems. And those arcs end at the node tells us how much the node needed help from coworkers. From the graph we can see that actor at the most center (CRA, BRG, TBT, SRAS, RHG, GUR, KAA, HZT, RHB, and YSHK) were key players with Fragmentation $\alpha = 0.228$. Nodes are sized based on degrees centrality or importance for knowledge and colors followed similarly. Many classifications than the above because of high differences

5.3. Statistical analysis of the networks

5.3.1. Comparing density of knowing each network against the parameter (standard)

Table4. Compare density of who know who with hypothesized parameter value of HEWs in Konso woreda 2012

Test description	Output
Density of WKW	0.7928
Parameter	.5000
Z-score	9.1210
Average bootstrap density:	0.7832
Proportion of absolute differences as large as observed	0.0002
Proportion of differences as large as observed	0.0002
Proportion of differences as small as observed	1.00002

. Proportion of absolute differences as large as observed is more significant that means the calculated density (0.7928) is far greater than the parameter at (Z=9.1210, p-value = 0.0002) so that hypothesis atleast 50% is acceptable and density of connection in HEWs is greater than 50%

5.3.2. Comparing density of information sharing network against the parameter (standard)

Table5. Compare density of information sharing network with hypothesized parameter value of HEWs in Konso woreda 2012

Test description	Outputs
Density of HEWs	0.2719
Parameter value	0.5000
z-score:	-8.5462
Average bootstrap density	0.2708
Proportion of absolute differences as large as observed	1.0000
Proportion of differences as large as observed	1.0000
Proportion of differences as small as observed	0.0002

Unlike that of WKW density here the INFOSH is below the parameter density and the difference of as large as is insignificant at (Z=-8.5462, p-value= 1.000)

5.3.3. Comparing densities of the two networks

Table6. Paired sample t-test for the two matrixes (WKW and INFOSH) of HEWs in Konso woreda 2012

Test descriptions	Output
Density of WKW	0.7928
Density of INFOSH	0.2719
t-statistic	21.3561
Average bootstrap difference	0.5090
Proportion of absolute differences as large as observe	0.0002
Proportion of differences as large as observed (WKW)	0.0002
Proportion of differences as small as observed(KDGSHA)	1.0000

By this method the densities of two relations for the same actors has been compared and standard errors to test differences is estimated. From this test it is possible to conclude that density of WKW is far greater than the density of INFOSH (p-value = 0.0002)

Table7. QAP Correlation coefficients among all variables under study for HEWs in Konso woreda 2012

	Kdgsh	Wkw	Perf	Lang	Relig	Expr	Grdsh	Marstat	Media	Rfsh	Site
INFOSH	1.000										
WKW	0.168**	1.000									
PERF	0.050*	0.051*	1.000								
LANG	0.060*	0.064	-0.029	1.000							
RELIG	0.044	0.122**	0.007	0.378**	1.000						
EXPR	-0.017*	-0.203**	-0.007	-0.136	-0.172*	1.000					
GRDSH	0.013*	0.081**	0.028	0.082	0.063*	-0.153**	1.000				
MARS	0.040**	0.103**	0.134**	0.085	0.110*	-0.190**	0.059*	1.000			
MED	-0.074	-0.098**	-0.778**	-0.012	-0.032	0.074*	-0.063*	-0.132**	1.000		
RFSH	-0.017	-0.034*	0.064*	0.011	-0.010	0.049	0.069*	-0.028**	-0.078	1.000	
SITE	-0.018	0.048*	0.003	0.076	0.040	-0.076	0.024*	0.005	-0.039	-0.023	1.000

Note * p<0.05, ** p<0.01; where PER= performance, EXPR=experience, KDGSH= information sharing, GRKS= grading information share, MARSTAT= marital status, RFSH= reason for information share, LANG= language, RELIG= religion and other with their names

The table shows the overlapping and interdependence among all variables. Most of the variables were significantly correlated. The highest correlation occurred between knowing media and performance (r= 0.778, p<0.0001)[3] and between knowing each other and information sharing(r=0.168, p<0.0001).The dependent variable correlated with all the dependent variables of the respondents. The high correlation among performance and media was in the expected direction that, since those who have good knowledge of media shared knowledge highly, the performance related to both and the same for knowing each other and information

[3] The fear of multi-collinearity in correlation among variables understudy was not remarkable since VIF <5

sharing. Since almost correlation coefficients were less than 0.5 multi-collinearity was not a concern.

5.3.4. Multiple regression quadratic assignment procedures

Table8. Factors mediating information sharing among HEWs via double Dekker semi- partialling MR-QAP in Konso woreda 2012

Independent	Unstdized Coeff	Stdized Coeff	Signi	Proportion As Large
Intercept	0.243		0.000000	
Exprience	-0.0409	-0.0419	0.0085	0.0085
Marital status	0.0155	0.0171	0.1559	0.1559
Performance	**0.0466**	**0.0524**	**0.01450**	**0.01450**
Media	-0.0430	-0.0466	0.0055	0.9950
Language	0.0206	0.0233	0.4098	0.4098
Reason for sharing	-0.0147	-0.015	0.1469	0.8536
Religion	0.0207	0.0232	0.4668	0.4668
Site	-0.110	-0.0835	0.0005	1.0000
Grading Info sharing	-0.0046	-0.005	0.3893	0.6112
Who know who	0.1722	0.1567	0.0005	0.0005

R-square	Adj.R.Squ	Probability	# of Obs.
0.036	**0.034**	**0.000**	**6806**

It is people of different sites shares share informationwith each other significantly at (p = 0.0005). Who know who is significant at (p = 0.0005) which means those sharing information from different sites knew each others. Media (media for information sharing) is significant at (p-value = 0.0055) that is people of different knowledge of media of information sharing or those with less knowledge of media came to those of high knowledge. Performance of each health HEWs was taken from health office and with other variables it was also significantly associated information sharing at (p-value = 0.01450). Examination of the magnitude of standardized coefficients enabled us to assess the relative importance of predictors. Age and ethnicity were removed from analysis because they don't affect any variable when removed or present.

6. DISCUSSION

6.1. Knowing Each Other Network Analysis

In this network, both indegree and out degrees were equal suggesting that on average each individual in the network were influenced others and influenced by others equally (equal popularity and sociability) no attraction affinity; everything varies. The variability is very high in out degree that is an indication of little influence. It starts with zero (table2) because from total participants, one person can influence a maximum of 82 individuals (except self). There was no actor with central advantage all actors' popularity largely varies. From literatures individuals with highest number of nominations were explained as identified the true experts(28). This means they provide necessary information for other easily which was not in this network. Such network are directed networks.(48)

On base of the centralization the network in and out degree centralizations were small. These indicate the network is homogeneous in term of variability from individual to individual. It confirms what was observed from in and out degree as they were the same. Thus, in knowing each other network, the distributions of network characteristics were again equal. From literature high centralization indexes were determined as higher heterogeneity across networks i.e. high variability in higher centralization indexed networks. (39, 48)

In the same way the Eigenvector or the sum of the geodesic distances from each actor to all others (farness) or distance needed to be covered by an actor to be very popular was very small. In Literature it was understood that the higher the eigenvector the more central become the actor and vice versa(49) This means actors were more peripheral in this network, there was no centralization tendency.

In other words, betweenness centrality was11.1 indicated that around 89% of the ties in the network were not needed mediators to be connected. From standard description of experts, it was concluded that in such networks, it was individual information sharing behavior which is very vary.(48).

But knowing each other network was adequately dense. This might make us to think information sharing network could dense. Because literatures explain that higher levels of connectivity increases access to knowledge and give protective effect for knowledge management (14, 38). Other similar study conducted in North Korea showed density of 69%. This might be due to the reason that HEWs have to meet all workers from trainings than immigrant women of North Korea

6.2. Information sharing Network Analysis

Similarly, in degree and outdegree in information sharing network is small and the same on average. Of course Fig.2 concludes that there were individuals who have dominance advantage in the network. It indicated that there was a tendency of formation collections of actors at the center of the graph. And so some actors depend on to obtain knowledge small that are at the center. A study conducted in Barcelona described that for the directed network in and out degree distributions are almost identical(37). Therefore this is usual characteristics of directed network

Centralization of this network was very different especially outdegree that shows high heterogeneity. It means there were very limited actors who were very popular in giving relevant information needed for HEWs. The coefficient of variability for out degree was 89% which again concluded that HEWs were very different in out degree centralization. This was clearly observed where actors: CRA, BRG, TBT, SRAS, RHG, GUR, KAA, HZT, RHB, and YSHK were identified occupying central part of the graph and were most information diffusers of the team. Studies see this in negative side that means, higher network centrality means that power is in few hands, while the mutual exchanges between other members are less. When central actor left the team there will be a greater loss on information sharing(21). This is because the network was highly dependent on the identified key players (fig.2).

Similarly, indegree centralization for information sharing was small describing in seeking after the knowledge of the group HEWs was homogeneous. Many studies confirm this, by explaining homogeneity increased with centralization index decreases and the reverse is also true. In receiving the information the team is the same (14, 28, 35).

Betweenness (table3) indicates that more than half of actors in information sharing network were depended on others to be connected to other actors. This indicated that there were a lot of individuals who were not communicating with source of knowledge. The eigenvector was only 15. This means, Eventhough the network is centralized the tendency of actors to toward center is very small. This means except those at center, other actors are at peripheral which indicate HEWs acting as source of knowledge are very small in compare to whole actors. These were explained in other studies as the properties of more dependency networks (21, 35, 36).This characteristics may be due to, since most actors were receiver.

The overall density of information sharing network was only 1/3 of the expected ties that indicates inadequate knowledge in HEWs. That might be interrelation was not fairly for information sharing. But when this observed in relation to similar studies; it was greatly varied. Compared to density of study done in different places: 1.8% in Kentucky USA 2011, 2.5% in Portugal 2008, 69% in North Korean (28, 29). The difference in density still doesn't make any supervise, since density can simply intense as size of the network narrows and the opposite as it larger. But other study said that density of around 15-20% is expected to support information sharing in a network of about 100 members(50). In this regard the density is fair

6.3. Statistical analyses

Of course different studies accept information sharing density of >50% as good information sharing density although the achievement is not this much(29). In considering this in the current study it was insignificant for information sharing and highly significant for knowing each other network comparing to the parameter (table 4 and 5).

When correlation of each variables understudy checked pairing the two networks to check whether the difference was randomly occurred, the paired t-test showed there was a significantly gap (table 6). This means density of information sharing network is small. This concluded that all people who connected to each other were not always share information rather they need additional things. Of course some studies indicates very high density will has the opposite effect on the performance

i.e. too high or low density of the network are not conducive to the knowledge sharing(51)

As expected knowing media where to share was highly correlated with work performance same as knowing each other and information sharing. In these highly correlated variables, we don't expect less correlation, so we accept positively. Generally the correlation observed (table 7) were not sufficient to concern about multi-collinearity(52),since most coefficients satisfy, $r \leq 0.5$ according to Jensen (2003)

Work experience was significant associated with information sharing. This suggests information sharing tie existed among HEWS of different experiences. This means HEWs with relatively short periods experience were going to those with relatively long periods of experience for advice. This is consistent with other study where number of years since graduation was negatively associated to information sharing of health professionals ($\beta = -0.0318$; $p < 0.01$)(42). This might be due to, either recent increase in new members or HEWs were really sharing their experiences.

Knowledge of media of information share significantly associated with information sharing. It means HEWs who have less knowledge of media of information sharing were tied with those who have good knowledge of Medias. Studies suggest that, at a minimum, the informal structure supplements the formal structure in facilitating knowledge flows(53) and knowing where to share is found very important(21). In fact meetings usually considered as helpful for sharing information. Members of low-performance described meetings as not beneficial and reported that quit participating and high-performance staffs insisted on sharing experiences. Meeting is considered as step one to work together and share information (54). The difference might be, some HEWs were not aware of where and when to share information while those who aware were sharing to them.

It was also identified that, work performance was positively associated with information sharing. of course from other literatures, closer relationships result from more frequent and more relevant information and knowledge exchanges among high performance partners(55). In Kentucky hospitals, it was identified that

improving the efficient dissemination of knowledge in health care professionals enhanced daily job performance (29). The consistency might be, information sharing in HEWs resulted in significant improvement in work performance.

Site or place of works was significantly associated with information sharing. It identified HEWs of different site of work shared information. But other study stated people who were affiliated with the same places and located in the same geographic area were more likely to collaborate share information($\mathfrak{B}$ = 0.0845; p < 0.01) (42). The difference may be due to the fact that Konso woreda is small compared to geographical area where cross sharing was enabled or the HEWs information sharing was only occur during trainings/meetings, but not while they are at work place. Of course another study found that geographical distance was negatively associated to information sharing and investigators concluded that international distance don't much matter (56).

Know each other found to be significantly associated to share i. That is when HEWs know each other they exchange relevant information important to make decision. Researches revealed that knowing each other mediates the effect of proximity on information seeking that when an individual know others expertise, seeking information from that individual rises (57). Of course this might be, since all HEWs mostly trainee together, it enabled them to know expertise and share information. But other study observed trainings said, information sharing mostly affected by the time duration of the trainings (14). Thus, the information sharing of HEWs might be more improved, if recent time of trainings or staying together improved.

In this study, the access to sharing information is not significantly associated information sharing. In other studies it was described that knowledge acquisition in health care has traditionally come from many ways, like local, national, and international conferences, but those ways that are available might not be accessible for all professionals given their many responsibilities and generally inadequate staffing therefore access was associated(29). The reason for difference

may be due to the difference in status of study population and awareness of importance of information sharing and the fact that small HEWs were sharing knowledge, because studies showed people of the same profession share their knowledge to improve patient care.(16)

The reason or the vision why HEWs sharing information was not associated with information sharing. The available references indicates that both the service receiver and provider should have a clear common vision and goals for partnership as well as a belief that their partners will not act opportunistically (28). From other study it was confirmed that there should be constrain that initiate information sharing.(34). The insignificancy might be due to less awareness to the constraints and ways to solve and less consideration of goal of the program

7. LIMITATIONS AND STRENGTH

8.1. Strength

- ✓ Roster method of data collection was made, might reduced recalling problems
- ✓ Information sharing was comparatively assessed
- ✓ we concentrates on the overall system of relations exchanges rather than on the single relationships

8.2. Limitation

- ✓ The result of this study should transferred with caution because the whole network used that can be considered rather as a case study
- ✓ Peer to peer evaluation was not made.

8. CONCLUSIONS

Density of knowing each other was higher than density of information sharing that meant HEWs knew each other but only some HEWs share information. In terms of centralization, information sharing network was centralized while that of knowing each other was not centralized

Health extension workers' reporting to eight health center (8 sites) has negative information sharing that they don't sharing with in a site which indicates information sharing in health extension workers do not follow expected or usual ways of sharing, since the key players making people to know each other were also not facilitating information sharing

HEWs who share information found to have good work performance but there was negative difference regarding experiences among those HEWs who share information to each other (it was experience versus less experienced).

In general HEWS knowing appropriate media for information sharing, similar work performance, different years of work experience, who were working in different sites but who know each other were found sharing information to each other.

9. RECOMMENDATIONS

For woreda H/office and other concerned bodies

Inadequate information sharing was observed, thus evaluation how they performs work might be needed

Since information shared through informal contacts, awareness of HEWs during trainings, meeting and evaluation might be very important

To improve sharing within site, activities like preparing the site report together and Site report presentation for supervisors might be very helpful

For HEWS

HEWs should be aware of what their friend practicing.

They should think that others know better

For researchers

Further studies invited to investigate information sharing with more predictors to more focus on ways of sharing in health extension program for better improvement.

To explore actors performance, we suggest a more objective measure, designed especially for such purpose, which reduce risk of evaluating unnecessary dimensions, because the performance we used might be unsatisfactory

10. REFERENCES

1. Gil-Garcia, R. J, T.A., Pardo, Burke GB. Government Leadership in Multi-Sector IT-Enabled Networks: Lessons from the Response to the West Nile Virus Outbreak, Leading the Future of the Public Sector. The Third Transatlantic Dialogue, University of Delaware, Newark, Delaware, USA. 2007.
2. Banteyerga H. Ethiopia's Health Extension Program: Improving Health through Community Involvement. MEDICC Review. July 2011 13(3):46-7.
3. Kong S. Capacity Project in Ethiopia : Capacity Project Country Brief series. IntraHealth International. July 23, 2008(8).
4. Serrat O. Knowledge Solutions :Social Network Analysis. Asian Development Bank. February 2009;3.
5. Meltzer D, Chung J, Khalili P, Marlow E, Arora V, Schumock G, et al. NIH Public Access: Exploring the Use of Social Network Methods in Designing Healthcare Quality Improvement Teams. Soc Sci Med. September, 2010;71(6):1119-30.
6. Cross R, Parker A, Prusak L, Borgatti SP. Knowing What We Know: Supporting Knowledge Creation and Sharing in Social Networks. Organizational Dynamics. 2001 30(2):100-20.
7. Chen IYL, Chen N-S, Kinshuk. Examining the Factors Influencing Participants' Knowledge Sharing Behavior in Virtual Learning Communities. Educational Technology & Society. 2009;12(1):134-48.
8. Tichy NM, Tushman ML, Fombrun C. Social network analysis for organizations. Academy of Management Review. 1979;4(4):507-19.
9. Tanya Y, Berger-Wolf, Saia J. A Framework for Analysis of Dynamic Social Networks. KDD. 06, August 20–23, 2006.
10. Müller-Prothmann T. Social Network Analysis: A Practical Method to Improve Knowledge Sharing. StuttgartJuly 2, 2007. 219-33 p.
11. Landry R, Amara N, Pablos-Mendes A, Shademani R, Gold I. The knowledge-value chain: a conceptual framework for knowledge translation in health. Bulletin of the World Health Organization 2006;84:597-602.
12. Ramanadhan S, Wiecha JL, Emmons KM, Gortmaker SL, Viswanath K. Extra-team connections for knowledge transfer between staff teams
Advance Access publication. 15 June 2009;24(6):Pages 967-76.
13. Claudia M, Norbert G, Robert L. Application of social network analysis in Knowledge process, 2008.
14. Ramanadhan etal. Network-based social capital and capacity-building programs: an example from Ethiopia Human Resources for Health. 2010;8:17.
15. Helms R, Ignacio R, Brinkkemper S, Zonneveld A. Limitations of Network Analysis for Studying Efficiency and Effectiveness of Knowledge Sharing. Electronic Journal of Knowledge Management 2010;8(1):53 - 68.
16. Hew KF, Hara N. Identifying factors that encourage and hinder knowledge sharing in a longstanding online community of practice. Journal of Interactive Online Learning. 2006;5 (3).
17. Mattes WB, Pettit SD, Sansone SA, Bushel PR, Waters MD. Database development in toxicogenomics: issues and efforts. Environmental health perspectives. 2004;112(4):495-505.
18. Moshabbaki A, Jaha'nyan Se. A Trust-Based Model For Knowledge Sharing In ERP Adopting Organizations. Journal of Knowledge Management Practice. March 2009 10(1).
19. Sani NSM, Taib SM, Jusoff K, Shazi AR. Finding Knowledge in Students Social Network. World Applied Sciences Journal 12 (Special Issue on Computer Applications & Knowledge Management). 2011:47-54

20. Kebede W, Butterfield AK. Social networks among poor women in Ethiopia. International Social Work 2009 2009:357–74.
21. Liao K, Xiong H. Study on Knowledge Sharing of Community of Practice Based on Social Network Perspective. iBusiness. September 2011;3:283-6.
22. Chinowsky PS. A Social Network Model Analysis of Project Engineering. Social Network Analysis – Project Engineering. May 2008.
23. Ingram GK, Chhibber A, Elliott V, Gwin C. Enhancing development effectiveness through exellence and independence in evaluation. The world bank operations evaluation department. 2003.
24. Broekel T, Boschma R. Knowledge networks in the Dutch aviation industry:the proximity paradox. cognitive science and communicative research center. June 17, 2009.
25. Skoner PD, Doyle WJ, Cohen S, Brissette I. Social Integration and Health:The Case of the Common Cold. Journal of Social Structure.1 http://www.cmu.edu/joss/content/articles/volume1/cohen.html.
26. Huang C-M, Chan E, Hyder AA. Web 2.0 and Internet Social Networking: A New tool for Disaster Management? - Lessons from Taiwan. BMC Medical Informatics and Decision Making. 2010;10:57
27. Firestone JM, McElroy MW. Doing Knowledge Management. The Learning Organization Journal. 2004;12(2).
28. Marques DV, Cardoso L, Zappalá S. Knowledge sharing networks and performance. Comportamento organizacional E getao. 2008;14(2):161-92.
29. Wiemken TL, Ramirez JA, Polgreen P, Peyrani P, Carrico RM. Evaluation of the knowledge-sharing social network of hospital-based infection preventionists in Kentucky. American Journal of Infection Control 2011(xxx):1-6.
30. Lee B, Youm Y. Social Network Effects on Post-Traumatic Stress Disorder (PTSD) in Female North Korean Immigrants. Journal of Preventive Medicine and Public Health. July 2011;44(5):191-200.
31. Skoner DP, Doyle WJ, Cohen S, Brissette I. Social Integration and Health:The Case of the Common Cold. Journal of Social Structure 1 http://www.cmu.edu/joss/content/articles/volume1/cohen.html.
32. Sales AE, Estabrooks CA, Valente TW. The impact of social networks on knowledge transfer in long-term care facilities: Protocol for a study. Implementation Science. 2010;5:49.
33. Röll M. Distributed KM - Improving Knowledge Workers' Productivity and Organisational Knowledge Sharing with Weblog-based Personal Publishing. Paper presented to BlogTalk 20, "The European Conference on Weblogs", Vienna. July 5th and 6th 2004.
34. Kutzschenbach Mv. Organizational Learning and Social Network Structures: Case Studies of German and Norwegian Forest Sector Organizations. 2006:62-180.
35. Davis KE, Spielman DJ, Negash M, Aye G. Smallholder Innovation in Ethiopia: Concepts, Tools, and Empirical Findings. Paper prepared for the Innovation Africa Symposium. 21-23 November 2006.
36. Aviv R, Erlich Z, Ravid G, Geva A. Network Analysis of Knowledge construction in Asynchronous Learning networks JALN. September 2003;7(3).
37. Gómez V, Kaltenbrunner A, López V. Statistical Analysis of the Social Network and Discussion Threads in Slashdot. Social Networks & Web 2-0 -Analysis of Social Networks & Online Interaction. 2008.
38. Hall JN, Moore S, Shiell A. Assessing the congruence between perceived connectivity and network centrality measures specific to pandemic influenza preparedness in Alberta. BMC Public Health. 2010;10:124.
39. Mayo M, Pastor JC. Network and effectiveness in work teams: The impact of diversity. Deposito legal 2005.
40. Martin JL. A General Permutation-Based QAP Analysis Approach for Dyadic Data from Multiple Groups. CONNECTIONS. 1999; 22 (2):50-60.

41. Dekker D, Krackhardt D, Snijders T, A. B. . Sensitivity of MRQAP Tests To Collinearity And Autocorrelation Conditions. Psychometrika. Dember, 2007;72(4):563-81.
42. Mascia D, Cicchetti A, Fantini MP, Damiani G, Ricciardi W. Physicians' propensity to collaborate and their attitude towards EBM: A cross-sectional study. BMC Health Services Research. 2011;11:172.
43. konso CSA. konso wereda health statistics report: The unpublished materials. 2012.
44. Evans MM. Knowledge Sharing: An empirical study of the role of trust in an organizational setting. Doctoral Research Proposal. 2010.
45. Marin A, Wellman B. Social Network Analysis: An Introduction. Carrington P, Scott J, editors. London: Sage; June 11, 2009. 16 p.
46. Penuel WR, Sussex W, Korbak C. Mapping the Distribution of Expertise and Resources in a School: Investigating the Potential of Using Social Network Analysis in Evaluation. Paper presented at the Joint Conference of the Canadian Evaluation Society and the American Evaluation Association, Toronto, Ontario, Canada. October 2005.
47. Linda C, Jeremy M, Grimshaw, Nielsen C, Judd M, Coyte PC, et al. Use of communities of practice in business and health care sectors. Implementation Science. 2009;4:27.
48. Hanneman RA, Riddle M. Introduction to Social Network Methods: Chapter 1: Social Network Data. 2005 [cited 2012 5/29/2012]; Available from: hanneman/My%20...ts/Network_Text/Version2/C1_Social_Network_Data.html.
49. kilduff M, tsai W. S o c i a l N e t w o r k s a n d O r g a n i z a t i o n s. First ed. London , Thousand Oaks , New Delhi: SAGE Publications; 2003.
50. Parise S. Knowledge Management and Human Resource Development: An Application in Social Network Analysis Methods. Advances in Developing Human Resources. 2007;9(3):359-83.
51. Thompson M. Structural and Epistemic Parameters in Communities of Practice. Organization Science. 2005;16(2):151-64.
52. Gresov C, Stephens C. The context of inter-unit influence attempts. Administrative Science Quarterly. 1993;38(2):252 - 76.
53. Marouf L, Doreian P. Understanding Information and Knowledge Flows as Network Processes in an Oil Company.1:30.
54. Mlis BMA, Mcinerney CR, Meese A, Orzano AJ, Vamanu. knowledge sharing processes and tools in u.s.a primary health care: analysis of four case studies.1:12.
55. Lee J-N. The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success
Information & Management. 2001;38:323±35.
56. Broekel T, Boschma R. knowledge networks in the dutch aviation industry: the proximity paradox. cognitive science and communication research center. June 17, 2009;1.
57. Borgatti SP. A Relational View of Information Seeking and Learning in Social Networks. Management Science April 2003;49(4):432-45.

Annex 1- Conceptual Framework

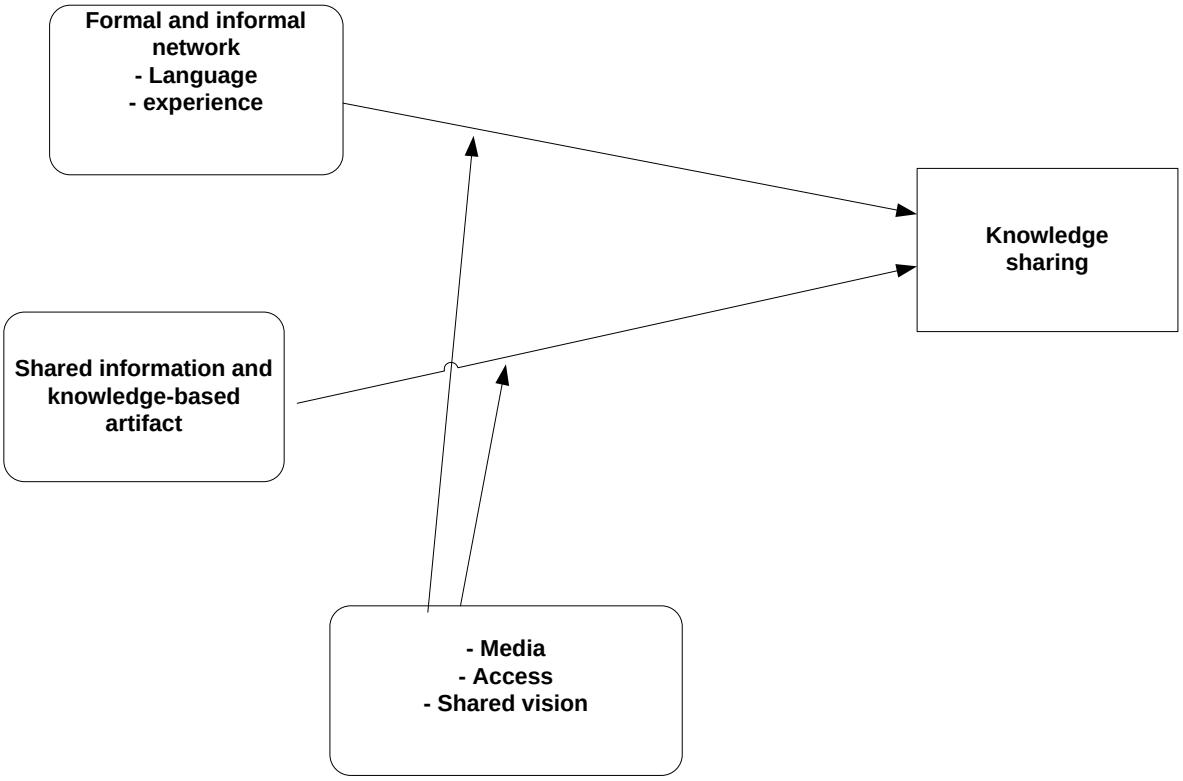

Fig.2 conceptual framework of information sharing using SNA modified from Bosua and Scheepers (2007) model for assessment of information sharing.

Annex 2: English Version Consent Form and Questionnaire

Hello! My name is …….. I am here on behalf of

Girma Gilano, student of the institute of Public Health in the University of Gondar. He is conducting a research for the partial fulfillment of second degree on "Assessment of information sharing through social network analysis among health extension workers in Konso". He has received permission from school of public health at university of Gondar, District Health Office and respective kebeles administrators to conduct this study. The objective of this study is to assess information sharing through social network analysis among health extension workers. You were selected for the study because you are in the study group with the hope that you will cooperate with us. We are kindly requesting you to answer the questions that we have prepared for you. We assure all information gathered during the course of the study will be kept completely confidential. All the information that you are going to deliver to us will be coded for anonymity. Only the principal investigator and the research assistants collecting the data will have access to the data. Would you be willing to participate? Yes …….1 No ….2

Having been well explained and informed of the intentions and benefits of the study, I voluntarily consent to participate in the study.

Respondent

Sign. Date

_____ _____ _____

provider name Sign. Date

_____ _____ _____

QUESTIONNAIRE

OBJECTIVE:

The primary aim of this study is to measure and map information sharing relationships among health extension workers. The study will see the ways you help each other or your co-operation in solving clients or community problems. Thus it is very important to maintain or improve the mentioned aims.

Thank you for participating in this survey of information sharing. This survey will take some minutes of your time. However, your individual responses will remain completely confidential. Participation is very important and has a direct impact on research.

INSTRUCTIONS:

This survey has two sections. In Section I, we provide a list of the names of people that work in your field and we ask 2 questions about the way you interact with them. In Section II, we ask you a few questions about yourself

The results will be only used to illustrate concepts of social network analysis and this means people will see only data which is NOT connected to your name or your identification as it is the part of confidentiality. Although your full response is very important, it will only be your decision to finish or withdraw off filling questionnaire

Section I: social network questions

For the following questions in the table

- choose one and write only the number contain your choice in the table below

Hint: the following are regarding information sharing with your co-workers; please before filling questions read these things very carefully:

1. **Information sharing means** having exchanged health extension work-related relevant information which is important to make decision, to perform daily activities and to carryout community serving activities with another health extension worker in Konso woreda over the past 6 months

2. **Know means** “Looking back over the last six months the person that you either talked, worked, attained (meting, training) together

3. ***Often*** = two contacts speak often with one another and are familiar with one another

4. ***Sometime =*** two contacts speak with each other from time to time and know something about one another, but are not especially close

5. Rarely=two health extension workers speak infrequently and are unfamiliar to each other

Staff Name	1.do you know her (**select one**) 1. Yes 2. No	2.Do you share informationwith her (**select one**) 1. Yes 2. NO
1. Staff1		
2. Staff2		
3. Staff3		
4. Staff4		
.		
.		
…staff 83…		
Please add names below if the person is not on the list and follow the same way of filling as above in corresponding columns and boxes		

Section II: individual question

Please answer the questions in this section about yourself by encircling the appropriate numbers provided next to each question in the table below.

Your site of work is _____

S.No	Questions	Answers

001	Age	1. less than 20 years 2. 21-30 years 3. 31-40 years 4. Greater than 40 years
002	Ethnicity	1. Konso 2. Gewada 3. other (specify) _____
003	Religion	1. Protestant 2. Orthodox 3. Muslim
004	Educational status	1. diploma 2. 10+1
005	your work experience	1.<1 years 2.1-2years 3.3-4 years 4.>4 years
006	What is your Marital Status?	1. Single 2. Married 3. Separated 4. widowed 5. Divorced
007	Your first language is	1. Konsegna 2. Amharic 3. Oromegna 4. Other (specify) _____
008	I am exchanging relevant information with health extension workers because (encircle all possible answers)	1. Since we are all in health extension profession 2. the goal of the program can not achieved alone 3. we are serving the same community 4. I believe that it is difficult to solve daily problems alone
009	what are the possible media to get information from your colleagues (encircle all possible answers)	1. Mobile phone 2. Meting/evaluation 3. Training 4. Others (specify)_____
010	If you grade the way you access information from other health extension workers, it is	1. very narrow 2. medium 3. very high 4. I don't know

Thanks for your co-operation!

Annex 3- Information Sheet

Title of the Research Project

Assessment of information sharing through social network analysis among health extension workers in Konso in 2012, southern Ethiopia.

Name of Principal Investigator: Girma Gilano

Name of the Organization: Institute of Public Health, Gondar College of Medicine and Health Sciences, University of Gondar.

Name of the Sponsor: University of Gondar

Information Sheet and Consent Form Prepared for the health extension workers currently working in Konso woreda who are going to participate in this Research Project,- information sharing through social network analysis among health extension workers.

Introduction

This information sheet and consent form is prepared with the aim of explaining the research project that you are asked to join by the group of research investigators.

The main aim of the research project is to assess information sharing through social network analysis among health extension workers.

The research group includes 6 trained unemployed diploma nurse from Konso karat town and two advisors from University of Gondar.

Purpose of the Research Project

The aim of this study is to assess information sharing in health extension workers through social network. To achieve their objectives they have to equip with all the necessary knowledge which is usually impossible to have at the occasion of employment. This gap will be fulfilled only with information sharing among one another. The results of this study will be used as a basis, especially in the study area, to design appropriate intervention programs to address the problem. In the past there is no study conducted in the study area, which increases the importance of the study. It will also add additional way of supporting and rapid up the program's goal accomplishment for planners and coordinators when ways of information sharing identified.

Procedure

As this study involves all health extension workers currently working at Konso woreda for assessment, you are selected to be one of the study participants if you are willing to take part in this study. You are selected for this study because you are currently working as a health extension worker in Konso woreda.

In order to assess the information sharing in health extension workers, we kindly invite you to take part in our project. If you are willing to practice in our project we are so happy for you to participate in this study and we need you to clearly understand the aim of this study and to sign the consent form .Then; you are kindly requested to give your response to the data collectors. For this questionnaire based study, study subjects are all health extension workers currently working at Konso woreda. All the response given by participants and the result obtained will be kept confidentiality by using coding system whereby no one will have access to your response.

Risk and /or Discomfort

By participating in this research project you may feel that it has some discomfort especially on wasting your time (a minimum of 40 minutes) but this may not be too much as you are one of the member of the community, so your response will help as an important input to show the gap and means to improve information sharing. There is no risk in participating in this research project.

Benefits

If you are participating in this research project, there may not be direct benefit to you but your participation is likely to help us in showing the gap of low information sharing and help to develop better improvement of the information sharing ways

Incentives/Payments for Participating

You will not be provided any incentives or payment to take part in this project.

Confidentiality

The information collected for this research project will kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. And it will not be revealed to anyone except the principal investigator and assistants will be kept locked with key.

Right to Refusal or Withdraw

You have the full right to refuse from participating in this research. (You can choose not to response some or all the questions) and this will not affect you in anyway. You have also the full right to withdraw from this study at any time you wish, without losing any of your right.

Person to contact

This research project will be reviewed and approved by the ethical committee of the University of Gondar. If you want to know more information you can contact the committee through the address below. If you have any question you can contact any of the following individuals and you may ask at any time you want.

1. Mr. Girma Gilano: Arba Minch health Science College. Mobile: 0913930384 / e-mail: girmagilano@gmail.com

2. Dr. Berehun Megabiaw (MD, MPH): Biostatistics and epidemiology department, co-ordinator of health officers ,university of Gondar College of Medicine and Health Sciences, Institute of public health
mobile:0912127173/email-baredomega@gmail.com

3. Mr. Atinkut Alamirrew (BSC, MPH)
Head and Lecturer in Health Informatics Department University of Gondar College of Medicine and Health Sciences Institute of Public Health Gondar, Ethiopia
Mobile:0911313578:email-atinkut222@gmail.com

Annex 4- Amharic Version Consent Form and Questionnaire

የስምምነት ዉል ቀፅ ና መጠይቅ

ጤና ይስጥልኝ ስሜ ----------ይባላል ።እዚህ የመጣሁት በጎንደር ዩኒቨርሲቲ የህበረተሰብ ጤና አጠባበቅ ትምህርት ቤት ተማሪ የሆኑት አቶ ግርማ ግላኖን ወክየ ነዉ።እርሳቸዉ በኮንሶ የሚሠሩ የጤና ኤክስቴ¹ኖች ሠራተኞችን በተመለከተ በመቀራረብ ላይ የተማረተ የዕዉቀት ልውውጥ ዙሪያ ምርምር ያደረርጋሉ። ለዚህ ምርምር የሚሆን ፈቃድ ከጎንደር ዩኒቨርሲቲ የህበረተሰብ ጤና አጠባበቅ ትምህርት ቤትና ከወረዳ ጤን ፅ/ቤት እንድሁም ከቀበሌ አስተዳደሮች አግኝተዋል።

የምርምሩ ዋና አላማ በኮንሶ የሚሠሩ የጤና ኤክስቴ¹ኖች ሠራተኞች የሚያደረጉት የዕዉቀት ልውውጥን፣ መቀረረብን ምክንያት በማደረግ መዳሰስ ነዉ።እርስዎም የጤና ኤክስተንሽን ሠራተኛ ስለሆኑ በጥናቱ ላይ ይተባበሩናል ብለን ስላመንን ነዉ። እኛ ለዚህ ጥናት የሚሆን ጥያቀዎች አዘጋጅተናል¿ እርሶዎ እነዚህን ጥያቀዎች በመመለስ እንዲተባበሩን በአክብሮት እንጠይቃለን።

በዚህ ጥናት ሂደት ውስጥ የሚሰበሰበዉ ማንኛዉም ዓይነት መረጃ ሙሉ በሙሉ በምስጢር የሚጠበቅ መሆኑን ልናረጋግጥልዎ እንወዳለን።እንዲሁም እርስዎ የሚሰቱን መረጃ ሌላ ሰዉ ሊያዉቀዉ በማይችል መንገድ በምስጢር የሚቀመጥ ይሆናል።ከዋናዉ ተመራማሪ እና ከጥናቱ ረዳቶች በስተቀር ሌላ ማንኛዉም ሰዉ ለሰጡን መረጃ ፈቃድ አይኖረዉም። በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነዎት? 1. አዎ 2. አይደለሁም

የጥናቱን ዓላማና ጥቅም በደንብ ተገንዝቤና አዉቄ በዚህ ጥናት ለመሳተፍ በፈቃደኝነት ተመዝግበለሁ

ተሳታፍ ፍርማ ቀን

_____ ____ _____

_____

የመጠይቁ አቅራቢ

_____ _____ _____

<u>መጠይቅ</u>

<u>የመጠይቁ አላማ</u>: የጥናቱ ተቀዳሚው አላማ የኮንሶ ጤና ኤክስቴንሽን ሠራተኞች መካከል ሊኖር የሚችለውን የተደራጀ መረጃ ልውውጥን መለካትና መሳል ነው። ጥናቱ እንዴት እንደሚተረዳዱ ወይም ተባብራችሁ ደንበኛ ወይም የህብረተሰቡን ችግር እንደሚትፈቱ ለማወቅ እና የተጠቀሱትን አላማ የማሳካት ራይዕን የያዘ ነው።

በዕውቀት ዳሰሳ ጥናቱ ላይ ስለተሳተፉ እናመሰግዎታለን። ዳሰሳው ከሰዓትም የተወሰኑ ደቅቃዎችን ሊይዝ ይችላል። ቢሆንም ግን የሚሰጡን ምላሽ በፍዉም በምስጢር የሚያዝ ይሆናል። የርሰዎም ተሳትፎ በጥናቱ ላይ ቀጥተኛ ተዕኖ አለው።

መግቢያ

ይህ መጠይቅ ወይም ዳሰሳ ሁለት ክፍል አለው። በአንደኛው ክፍል በሙያችሁ የሚሠሩ ሰዎች ሥም ዝርዝር ቀርቦልና ለእያንዳንዱ ሰው በግንኙነታችሁ ዙሪያ 2 ጥያቀዎችን ትመልሳላችሁ። በሁተኛው ክፍል ደግሞ ስለራሳችሁ ጥቅት ትጠየቃላችሁ። የጥናቱ ውጤት የምጠቀመው ህብረተሰባዊ ግንኙነት ትንተና፣ ይህም ማለት ሰዎች ማየት የሚችሉት መረጃውን ብቻ እንጂ ከስማችሁ ወይም ከመለያ ቀጥራችሁ ጋሪ አይገናኝም። ይህም የሚስጢር መጠበቅ አንዱ አካል ነው። ሙሉውን ቢሞሉልን በጣም ደስ ይለናል፣ ቢሆንም ግን ማቋረጥም ውሳነዎት ነው።

ክፍል አንድ ህብረተሰባዊ ግኑኝነትን(የጤና ኤክስተንሽን ህብረተሰባዊ ነትዎርክ)ን የሚመለከት

ቀጥሎ በቀረበው በሠንጠረዠ ውስጥ ለቀረቡት 2 ጥቀዎች፡-

- አንዱን መልስ መረጠው መልሱን የያዘው ቁጥር ብቻ በእያንዳንዱ ሰው ፍት ለፍት ይፃፉ።

ፍንጪ:- ጥያቀዎቹ ስለ ዕውቀት መለዋወጥን ናቸው። እባክዎን ጥቀዎችን ከመመለስዎ በፍት ቀጥሎ የቀረቡትን በጥንቃቄ ያንብቡ።

1. ***መረጃ መለዋወጥን ማለት*** ባለፉት 6 ወራት ውስጥ የጤና ኤክስተንሽን ሥራን በሚመለከት ለውሳነ ፣በየቀኑ የሚሰራ ሥራን ለመሥራት እና ህብረተሰቡን ለመረዳት ወሳኝ የሆነውን መረጃ መለዋወጥን ማለት ነው።

2. **አውቀዋለሁ ማለት** ያለፉትን 6 ወራትን ሲያስቡ አብረው የተነጋገሩት፣የሠሩት፣ ወይም አብረው ሥልጠና ወይም ስብሰባ/ግምገማ ላይ የተገኘት ማለት ነው።
3. **በተደጋጋሚ** ማለት ሁለቱ ሰዎች በተደጋጋሚ እርስበርስ ይነጋገራሉ ማለት ነው
4. ***አንዳንድ ጊዜ*** ማለት ሁለቱ ሰዎች ከጊዜ ወደ ጊዜ እርስበርስ ይነጋገራሉ በጣም ባይቀራረቡም አንዱ ስለ ሌላው የሆነ ነገር ያውቃል ማለት ነው
5. **አልፎአልፎ** ማለት ሁለቱ ሰዎች ብዙውን ጊዜ አይነጋገሩምም አይተዋወቁም

የባልደርቦች ስም	1. እሷን ያውቃሉ? **(አንዱን ይመረጡ)** 1.አዎ 2. አይደለም	2. እሷ ጋሪ መረጃ ትለዋወጣላችሁ **(አንዱን ይመረጡ)** 1.አዎ 2. አይደለም
1.AMB		
2.ETT		
3.BRG		
4.RMR		
5.GNG		
6.NGG		
7.DSG		
8.GRK		
9.EHM		
10.MSAK		
11.MSTE		
12.GWG		
13.MSAKA		
14.ABJ		
15.BRM		
16.HGH		
17.KAGA		
18.SEG		
19.TEF		
20.BANA		
21.UO		
22.AZW		
23.FQG		
24.ATG		
25.CRA		
26.ORG		
27.YSHM		
28.URN		
29.KAKA		
30.TBT		
31SRT		
32.SHA		
33.SRAS		
34.RHG		
35.GALG		
36.TRC		
37.ABA		
38.FSB		
39.ZNS		
40.SROR		
41.BRA		
42.BTZ		
43.BLD		
44.GUR		
45.KAA		
46.KGU		
47.MGZ		
48.ESS		
49.AMLA		
50.ABRG		

51.GSO		
52.SBKU		
53.OLG		
54.YTAM		
55.HZT		
56.CFY		
57.SMGM		
58.ALMD		
59.RHB		
60.SEKE		
61.KSJ		
62.WGYG		
63.ASCE		
64.MEDZ		
65.ABAT		
66.NGK		
67.AYAD		
68.KSKA		
69.TACT		
70.TWW		
71.GMD		
72.AYT		
73.TSS		
74.KAKN		
75.ASMB		
76.BYGE		
77.MRMS		
78.AJAF		
79.TRUA		
80.ADGN		
81.ALMA		
82.ANAD		
83.YSHK		
ዝርዝሩ ላይ የለሌ ግን የግኑኝንታችሁ አካል የሆነን ከዚህ በታች ይፃፉና ይመሉ		

ክፍል ሁለት: ግላዊ ጥያቀዎች-እባኮን ቀጥሎ ስለራሶዎ ለቀረቡት ጥያቀዎች በመልስ ኮራ ሥር ከሚገኙት ምርጫዎች ትክክለኛውን መልስ መርጠው ይክበቡ። የሚሠሩበት ቦታ_____

ተ.ቁ	መጠይቅ	መልስ
001	ዕድሜ	1. ከ 20 ዓመት በታች 2. 21-30 ዓመት 3. 31-40 ዓመት 4. ከ40 ዓመት በላይ
002	ብሔረሰብ	1. ኮንሶ 2. ገዋዳ 3. ሌላ (ይገልጹ) _____
003	ሀይማኖት	1. ፕሮቴስታንት 2. ኦርቶዶክስ 3. መስሊም 4. ሌላ (ይገልጹ) _____
004	የትንህርት ደረጃ	1. ድፕሎማ 2. 10 ተ 1

		3. ሌላ(ይገልጹ) _____
005	የሥራ ልምድ	1. ከ 1 ዓመት በታች 2. 1-2 ዓመት 3. 3-4 ዓመት 4. ከ 4 ዓመት ብላይ
006	የጋብቻ ሁኔታ	1. ያለገባ 2. ያገባ 3. የተለያዩ (ተለያይተው ይኖራሉ) 4. የተፋቱ 5. ባል የሞተባት
007	የመጀመሪያ ቋንቋዎ	1. ኮንሰኛ 2. አማረኛ 3. ኦሮመኛ 4. ሌላ (ይገልጹ) _____
008	ከጤና ኤክስተንሽን ሠራተኞች ጋሪ ወሳኝ መረጃን የምለዋወጥበት ምክንያት (መልስ ሊሆን የሚችልን ሁሉ ይክበቡ)	1. አንድ ላይ የጤና ኤክስተንሽን ሙያተኞች ስለሆነን 2. የፕሮግራሙ ግብ ለብቻ ማሳካት ስለማይቻል 3. ተመሳሳይ ሕብረተሰብን ስለምናገልግል 4. በእኔ እምነት በየቀኑ የሚገጥሙንን ችግሮች መፍታት ስለሚከብድ
009	ከጤና ኤክስተንሽን ሠራተኞች የተደራጀ መረጃ እንዴት ያገኛሉ (መልስ የሆነውን ሁሉ ይክበቡ)	1. በሞባይል ስልክ 2. በስበሰባ/በግምገማ በኩል 3. በሥልጠና በኩል 4. ሌላ (ይገልጹ) _____
010	ከጎደኞች የተደራጀ መረጃ ማግኘት የሚችሉበትን መንገድ በደረጃ ተቀምጦ ቢታይ ምን ይመስላል	1. በጣመም ጠባብ ነው 2. መካከለኛ 3. በጣም ጥሩ ነው 4. አላውቅም የተደራጀ መረጃ ልውውጥ

እናመሰግናለን !

Annex 5 – Amharic version information sheet

የጥናቱ/የምርምሩ ርዕስ

በደቡብ ብሔር ብሔረሰብ ክልላዊ መንግሥት: በኢትዮጵያ በኮንሶ ወረዳ የሚገኙ የጤና ኤክስቴንሽን ሠራተኞች ባጠቃላይ የሚያደርጉትን የተደራጀ መረጃ ልውውጥን በህብረተሰባዊ ግኑኝነት መንገድ ማጥናት ነው።

የዋናው ተመራማሪ ሥም: አቶ ግርማ ግላኖ

የድርጅቱ ሥም: በጎንደር ዩኒቨርስቲ የህክምናና የጤና ሳይንስ ኮሌጅና የህብረተሰብ ጤና አጠባበቅ ተቋም

ይህ የመረጃ ስምምት ውል የተዘጋጀው በ አሀኑ ጊዜ በኮንሶ ወረዳ ላይ በመሰራት የሚገኙት የጤና ኤክስቴንሽን ሠራተኞች ባጠዋላይ በህብረተሰባዊ ግኑኝት አማካይነት የሚያደረጉት የተደራጀ መረጃ ልውውጥዙሪያ የዳሰሳ ይናት ለማጥናት ነው።

መግቢያ

የመረጃ ስምምት ውል ቅፅ የተዘጋጀው እርሶዎ ተሳታፊ እንዲሆኑ ስለተጋበዙ በምርመር ቡድን የሚካሔደው በተመለከተ ነው። የምርምሩ ዋና ዓላማ በኮንሶ ወረዳ በመሥራት ላይ የሚገኙት የጤና ኤክስቴንሽን ሠራተኞች ባጠቃላይ በሕብረሰባዊ ግኙኝነት አማከይነት የሚያደርጉት የተደራጀ መረጃ ልውውጥን ማጥናት ነው። የምርምር ቡድኑ ለዚህ ጥናት ሰለጠኑ እና በነርስንግ ሙያ ዲፕሎማ ያላቸው 6 የመረጃ ሰብሳብዎች ከኮንሶ እንዲሁም ሁለት አማካሪዎችን ከ ጎንደር ዩንቨርሲቲ ያካተተ ነው።

ፕሮጀክቱ የሚካሄድበት ምክንያት የጥናት

የጥናቱ ዓላማ በኮንሶ ወረዳ በመሥራት ላይ የሚገኙት የጤና ኤክስቴንሽን ሠራተኞች ባጠቃላይ በህብረተሰበዊ ግኑንት አማካይነት የሚያደረጉት የዐውቀት ልውውጥን መዳሰስ ነው። የተቀመጠላቸውን ግቦች ከዳር ለማድረስ የጤና ኤክስቴንሽን ሠራተኞች አስፈላጊ ዕቀውት ሁሉ መያዝ ይገባቸዋል። እንደተመደቡና ከዚያን በኋላም ግን ይህንን ማግኘት ይከብዳል። ይህ ክፍተት የሚሞላው የርስበርስ የተደራጀ መረጃ ልውውጥ ሲኖር ነው። ይህንን በህብረተሰባዊ ግኑኝት ማጥናት የጥናቱ ዋናው አላማ ነው። የጠናቱ ውጤት አግባብ ያለው የፐሮግራም ትግበራና ችግር መፍቻ መንገድ ለመንደፍ ይጠቀማል በተለይ ይናቱ በሚካሄደ አካባብ መሰረት ነው። ባለፈው ጊዜያት የዚህ ዕይነት ጥናት ባካባብው አለመካሄዱ የጥናቱን አስፍላጊነት ከፍ ያደርገዋል። በተጨማሪ ደግሞ ለጤና ኤክስቴንሽን ፕሮግራም ትግበራን ድጋፍ በመስጠት የፕሮግራሙን ግቦች በማሳካት በኩል ተጨማሪ ሚና ይጫወታል።

አተገባበር

ይህ ጥናቱ ዓላማ በኮንሶ ወረዳ በመሥራት ላይ የሚገኙት የጤና ኤክስቴንሽን ሠራተኞች ባጠቃላይ በህብረተሰበዊ ግኑንት አማካይነት የሚያደረጉት የዐውቀት ልውውጥን መዳሰስ ስለሆነ እርሶዎ እዚህ ወረዳ ከሚሠሩት የጤና ኤክስቴንሽን ሠራተኛ አንዱ እንዱም የዚህ ቀበሌ ነዎሪ ስለሆኑ ፈቃድዎ ከሆነ በጥናቱ እንድሳተፉ ተጋብዘዋል። እርሳዎ በጥናቱ እንዲሳተፉ የሚንጠይቀዎት የጤና ኤክስቴንሽን ሠራተኞች የተደራጀ መረጃ ልውውጥን ለመዳሰስ ነው። በፈቃድዎ በኛ ፐሮጀክት ላይ ማሳተፍ ቢችሉ በጣም ደስተኞች ነን። ስለሆነም የጥናተን ዓላማ በግልፅ ተረድተዎ በውል መጠይቅያ ቅፅ ላይ እንዲፈርሙልን በትህትና እንጠየቃለን። ከዚያ በኋላ ለመረጃ ሰበሳቢዎች ምላሽዎን እንዲሰጡ አሁንም በትህትና በትህትና እንጠየቃለን። በዚህ መጠየቅ ላይ የተመሰረተ ጥናት ተሳታፊዎቹ በአሁኑ ጊዜ በኮንሶ ወረዳ በመሥራት ላይ የሚገኙ የጤና ኤክስቴንሽን ሠራተኞች ናቸው። ማነኛውም ተሳታፊ የሰጠው ምላሽ የሚገኘው ውጤት ማንም በማይለየው ሚስጢራዊ መለያ/ኮድ ይሰወራል።

ሊጋጥም የሚችል ችግር/አለመመቸት

በዚህ ጥናት ላይ ተሳታፊ በመሆንም አለመመቸት የኖራል ብለው ሊያስቡት ይችላሉ በተለይም ደግሞ ጊዜዎን በመሻማታችን(30-40 ደቂቃዎች)፣ ነገር ግ እርስዎ እንደሚያሰቡት በጣም ብዙ ጊዜን አንሻማዎትም እንድሁም ደግሞ እርሰዎ የሰጡን መልስ ችግር መፍታት ግብዓት በመሆን ፕሮግራሙን ይደግፋል። በዚህ ጥናት ተሳታፊ በመሆነዎ ምንም ዓይነት ጉዳት አይደርስቦዎትም።

ጥቅሞች

እርሶዎ በዚህ ጥናት ተሳታፊ በመሆኑዎ በቀጥታ ሆነ በተዘወወሪ የሚያገኙት ሊያገኙት የሚችሉት ጥቅም አይኖርም። በመሆኑም የርሰዎ ተሳታፊነት በየተደራጀ መረጃ ልውውጥ አካባቢ

የሚታየውን ችግር አቃሎና ሳይቸገሩ መረጃ እንዲያገኙ የፕሮግራሙ አተገባበርን ለማሻሻል ይረዳል።

የመሳተፍ ጥቀማጥቀም

እርስዎ በዚህ ጥናት መሳተፍ የሚያገኙት ምንም ዓይነት ጥቅም አይኖረም። **ሚስጥራዊነት**

ለዚህ የጥናት ፕሮጀክት የሚሰበሰብ ማንኛውም ዓይነት መረጃ በምስጢራዊነት የሚጠበቅ ሲሆን እርስዎን በተመለከተ የሚሰበሰብ መረጃ እርስዎ ስም ሳይፍበት ነገር ግን ምስጢራዊነት ቁጥር ተሰጥቶት በፋይል ውስጥ የሚቀመጥ ይሆናል። እንደሁም መረጃው ከጥናት ዋና ተመራማሪ እና ረዳቶቹ በስተቀር ለሌላ ለማንኛውም አይነት ሰው ግልፅ አይሆንም።

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት

በዚህ ጥናት ያለመሳተፍ ሙሉ በሙሉ የተጠበቀ መብት አለዎት። (ለጥያቀዎቹ በሙሉም ሆነ በከፍል መልስ አለመስጠት መምረጥ ይችላሉ) ይህ ደግሞ ማነኛው ዓይነት አደጋ አይሆንም። እንዲሁም በማንኛውም በፈለጉት ሰዓት ማንኛውንም መብትዎን ሳያጡ የማቋረጥ ሙሉ መብት አለዎት።

ሊገናኙዋቸው የሚችሉ ሰዎች

ይህ የመርምር ፕሮጀክት በጎንደር ዩኒቨርሲቲ የሥነ ምግባር ኮሚቴ ተከልሶ የሚጸድቅ ይሆናል። የትኛውም ዓይነት ጥያቄ ሲኖርዎት ከዚህ ቀጥሎ የተጠቀሱትን ግለሰቦች መግኘትና በማነኛውም ጊዜ መጠይቅ ይችላሉ።

1.አቶ ግርማ ግላኖ ከአርበ ምንጭ ጤና ሳይንስ ኮሌጅ

0913930383/girmagilano@gmail.com

2. ዶ/ር በሪሁን መጋብያው ፡ ባዮስታትስትክስና እፕድሞሎጂ ድፓርተመት እና የጤና ሞኮነኖች ፕሮግራም አስተባባሪ ጎንደር ዩኒቨርሲቲ ፣የሜድሲንና የህብረተሰብ ጤና ሳይንስ ኮሌጅ ፣ የህብረተሰብ ጤና ተቋሚ

0912127173 /e-mail: beredomega@gmail.com

3. አቶ አትንኩት አላምረው፡ የሄልዝ ኢንፎርማትክስ ድረትመንት ለክቸረርና አስተባባሪ ጎንደር ዩኒቨርሲቲ ፣የሜድሲንና የህብረተሰብ ጤና ሳይንስ ኮሌጅ ፣ የህብረተሰብ ጤና ተቋሚ

0911313578/ e-mail:atinkut222@gmail.com

Annex 6– Declaration

I, the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of public health.

Name: Girma Gilano

Signature: _____

Place of submission: Institute of public Health, College of Medicine and Health Sciences, University of Gondar.

Date of Submission: _____

This thesis will be submitted for examination with my/ our approval as university advisor(s).

Advisors

Name	Signature
1. **Dr. Berihun Megabiyaw (MD, MPH**	_____
2. **Mr**. **Atinkut Alamirrew** (**BSC, MPH**)	_____